



554405

(43) International Publication Date
11 November 2004 (11.11.2004)

PCT

(10) International Publication Number
WO 2004/097094 A1

(51) International Patent Classification⁷: **D04B 15/68**

(21) International Application Number:
PCT/EP2004/004476

(22) International Filing Date: 28 April 2004 (28.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
MI2003 A 000899 2 May 2003 (02.05.2003) IT

(71) Applicant (for all designated States except US): **SANTONI S.P.A.** [IT/IT]; Via C. Fenzi, 14, I-25135 Brescia (IT).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LONATI, Ettore** [IT/IT]; Piazza Paganora, 5, I- 25121 Brescia (IT).

LONATI, Fausto [IT/IT]; Via Mediana, 15, I-25128 Brescia (IT). **LONATI, Tiberio** [US/US]; Via Sera, 24, I-25121 Brescia (US).

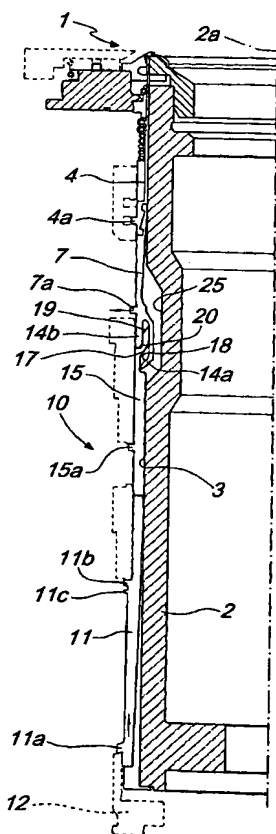
(74) Agent: **MODIANO, Guido**; Modiano & Associati, Via Meravigli, 16, IT-20123 Milano (IT).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,

[Continued on next page]

(54) Title: **CIRCULAR KNITTING MACHINE, PARTICULARLY OF THE MEDIUM-DIAMETER TYPE, WITH IMPROVED NEEDLE ACTUATION**



(57) Abstract: A circular knitting machine, particularly of the medium-diameter type, with improved needle actuation, which comprises a footing that supports a needle cylinder (2) rotationally actuatable with respect to the footing about its own axis (2a), which is orientated substantially vertically; multiple axial slots (3) formed on the outer lateral surface of the needle cylinder (2), each slot (3) accommodating a needle (4); a sub-needle (7) arranged below each needle (4) in a corresponding axial slot (3) and connected bilaterally to the corresponding needle (4) in its motion along the corresponding axial slot (3) and having, along its extension, a heel (7a) orientated radially with respect to the needle cylinder (2), the sub-needle being oscillatable on a radial plane of the needle cylinder (2) in order to pass from an active position, in which it is extracted radially with its heel (7a) from the corresponding axial slot (3) of the needle cylinder (2) so as to engage paths formed by sub-needle actuation cams (8), which are arranged around the needle cylinder (2) and are suitable to produce or allow a movement of the sub-needle (7) along the corresponding axial slot (3) of the needle cylinder (2) in order to actuate the overlying needle (4), to an inactive position, in which it is embedded with its heel (7a) in the corresponding axial slot (3) of the needle cylinder (2) so as to avoid engaging the sub-needle actuation cams; and a sub-needle actuation (10), which act on the sub-needle (7) for its transition from the active position to the inactive position and vice versa.